

## SECTION

## 2

Math

25 minutes

1. (A) (B) (C) (D) (E)
2. (A) (B) (C) (D) (E)
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14. (A) (B) (C) (D) (E)
15. (A) (B) (C) (D) (E)
16. (A) (B) (C) (D) (E)

17. (A) (B) (C) (D) (E)
18. (A) (B) (C) (D) (E)
19. (A) (B) (C) (D) (E)
20. (A) (B) (C) (D) (E)

Time: 25 minutes

Start: \_\_\_\_\_

Stop: \_\_\_\_\_

## SECTION

## 4

Math

25 minutes

21. (A) (B) (C) (D) (E)
22. (A) (B) (C) (D) (E)
23. (A) (B) (C) (D) (E)
24. (A) (B) (C) (D) (E)
25. (A) (B) (C) (D) (E)
26. (A) (B) (C) (D) (E)
27. (A) (B) (C) (D) (E)
28. (A) (B) (C) (D) (E)

Time: 25 minutes

Start: \_\_\_\_\_

Stop: \_\_\_\_\_

29.

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34.

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35.

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36.

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37.

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9	8	8	8

38.

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6	5	5	5
7	6	6	6
8	7	7	7
9	8	8	8



# Section 2

Time—25 minutes

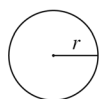
20 Questions

## Directions for Multiple-Choice Questions

In this section, solve each problem, using any available space on the page for scratchwork. Then decide which is the best of the choices given and fill in the corresponding oval on the answer sheet.

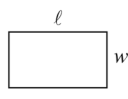
- You may use a calculator on any problem. All numbers used are real numbers.
- Figures are drawn as accurately as possible EXCEPT when it is stated that the figure is not drawn to scale.
- All figures lie in a plane unless otherwise indicated.

## Reference Information

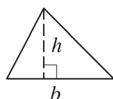


$$A = \pi r^2$$

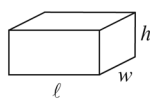
$$C = 2\pi r$$



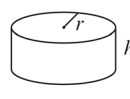
$$A = \ell w$$



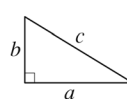
$$A = \frac{1}{2}bh$$



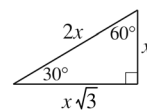
$$V = \ell wh$$



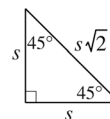
$$V = \pi r^2 h$$



$$c^2 = a^2 + b^2$$



Special Right Triangles



The arc of a circle measures  $360^\circ$ .

Every straight angle measures  $180^\circ$ .

The sum of the measures of the angles in a triangle is  $180^\circ$ .

- 1** The area of a rectangle with a height of 4 cm and a base of 6 cm is how many times greater than the area of a triangle with a height of 4 cm and a base of 4 cm?

(A) 1  
(B) 1.5  
(C) 2  
(D) 2.5  
(E) 3

- 2** If  $x = 2y + 2$ , how much greater is  $6x$  than  $12y$ ?

(A) 2  
(B) 6  
(C) 8  
(D) 12  
(E) 24

- 3** How many integers between 10 and 40 are divisible by both 2 and 6?

(A) Two  
(B) Three  
(C) Four  
(D) Five  
(E) Six

- 4** If it is now 4:30 p.m., what time will it be exactly 100 hours from now?

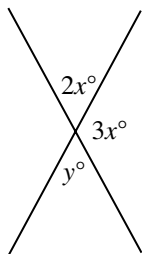
(A) 4:30 p.m.  
(B) 8:30 p.m.  
(C) 12:30 a.m.  
(D) 2:30 a.m.  
(E) 4:30 a.m.

- 5** Carrie, Denise, and Emily sold a total of 48 candy bars. If Emily sold four times as many candy bars as Denise did, and Denise sold three times as many candy bars as Carrie did, how many candy bars did Denise sell?

(A) 3  
(B) 6  
(C) 9  
(D) 12  
(E) 15

2

6



Note: Figure not drawn to scale.

In the figure above, what is the value of  $y$ ?

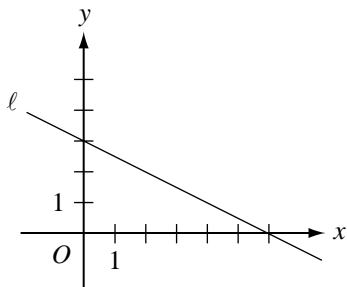
- (A) 72
- (B) 60
- (C) 48
- (D) 36
- (E) 40

7

Let the function  $f(x)$  be defined by the equation  $f(x) = 2x - x^2$ . Which of the following has a positive value?

- (A)  $f(0.5)$
- (B)  $f(0)$
- (C)  $f(-0.5)$
- (D)  $f(-1.5)$
- (E)  $f(-2.5)$

8



What is the equation of line  $\ell$  in the figure above?

- (A)  $y = -2x + 3$
- (B)  $y = -\frac{1}{2}x + 3$
- (C)  $y = -\frac{1}{2}x + 6$
- (D)  $y = \frac{1}{2}x + 3$
- (E)  $y = 2x + 6$

9

In a certain homeroom, the number of girls is 6 less than twice the number of boys. If the class contains  $b$  boys, which of the following would express the total number of students present in the class if 2 girls were absent?

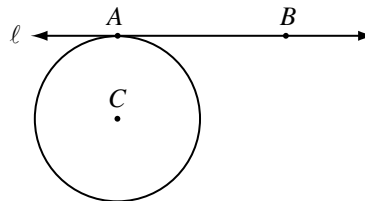
- (A)  $2b - 8$
- (B)  $2b - 4$
- (C)  $3b - 8$
- (D)  $3b - 6$
- (E)  $3b - 4$

10

If  $(x + 5)^2 = 0$ , what is the value of  $(x - 1)(x + 1)$ ?

- (A)  $-26$
- (B)  $-24$
- (C)  $0$
- (D)  $24$
- (E)  $26$

11



Note: Figure not drawn to scale.

In the figure above, the circle with center at  $C$  has a circumference of  $6\pi$ . If line  $\ell$  is tangent to the circle and  $AB = 4$ , what is the distance from  $B$  to  $C$ ?

- (A) 4.8
- (B) 5.0
- (C) 6.2
- (D) 7.0
- (E) 7.2

12

A set consists of five consecutive integers. The sum of these integers is  $-10$ . What is the greatest possible product that can be obtained by multiplying three different integers from this set?

- (A)  $-24$
- (B)  $-6$
- (C)  $0$
- (D)  $6$
- (E)  $24$

- 13** The first day of a 30-day month is a Monday. Which of the following is closest to the probability that a day picked at random from this month will be a Wednesday?

(A) 0.03  
(B) 0.07  
(C) 0.10  
(D) 0.13  
(E) 0.17

- 14** If  $|x| > 2$ , which of the following statements must be true?

I.  $x > 0$   
II.  $x^2 > 2$   
III.  $x^3 > 2$   
(A) II only  
(B) I and II only  
(C) I and III only  
(D) II and III only  
(E) I, II, and III

- 15** A jar contains only red, white, and blue marbles. If the number of red marbles is  $\frac{5}{6}$  the number of white marbles, and the number of red marbles is  $\frac{6}{7}$  the number of blue marbles, what is the least possible number of marbles in the jar?

(A) 18  
(B) 72  
(C) 101  
(D) 113  
(E) 123

**16**

8,  $a$ ,  $b$ , 27

In the sequence above, each term, except the first, is equal to the previous term times a constant. What is the value of  $\frac{b}{a}$ ?

(A) 1.125  
(B) 1.50  
(C) 3.375  
(D) 4.75  
(E) 6.33

- 17** The graph of which of the following points is below the graph of the line  $y = \frac{2}{3}x + 1$ ?

(A)  $(-1, 1)$   
(B)  $(1, 1)$   
(C)  $(1, 2)$   
(D)  $(3, 3)$   
(E)  $(4, 4)$

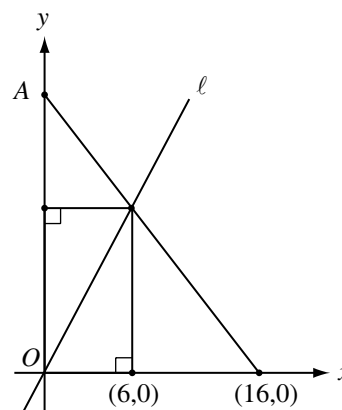
- 18** If  $3^{n-1} = 27^{-1}$ , then  $n =$

(A)  $-3$   
(B)  $-2$   
(C)  $-1$   
(D)  $1$   
(E)  $2$

- 19** If  $x + \frac{1}{x} = y$ , where  $x \neq 0$ , which of the following expresses  $x^2 + \frac{1}{x^2}$  in terms of  $y$ ?

(A)  $y^2 + 2$   
(B)  $y^2 + 1$   
(C)  $y^2$   
(D)  $y^2 - 1$   
(E)  $y^2 - 2$

**20**



Note: Figure not drawn to scale.

If line  $\ell$  in the figure above has a slope of 2, what are the coordinates of point A?

(A)  $(0, 7.2)$   
(B)  $(0, 13.2)$   
(C)  $(0, 14.4)$   
(D)  $(0, 18.4)$   
(E)  $(0, 19.2)$

**STOP**

You may check your work, on this section only, until time is called.

# Section 4

Time—25 minutes

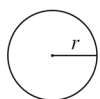
18 Questions (21–38)

## Directions for Multiple-Choice Questions

In this section, solve each problem, using any available space on the page for scratchwork. Then decide which is the best of the choices given and fill in the corresponding oval on the answer sheet.

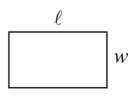
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## Reference Information

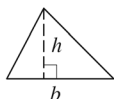


$$A = \pi r^2$$

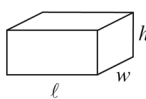
$$C = 2\pi r$$



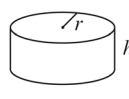
$$A = \ell w$$



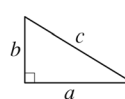
$$A = \frac{1}{2}bh$$



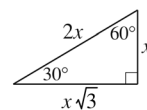
$$V = \ell wh$$



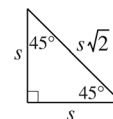
$$V = \pi r^2 h$$



$$c^2 = a^2 + b^2$$



Special Right Triangles



The arc of a circle measures  $360^\circ$ .

Every straight angle measures  $180^\circ$ .

The sum of the measures of the angles in a triangle is  $180^\circ$ .

- 21** If a square has a perimeter of 20 centimeters, what is one-half its area, in square centimeters?

(A) 10  
(B) 12.5  
(C) 20  
(D) 25  
(E) 50

- 22** Which of the following numbers is equal to one-third of its square?

(A)  $\frac{1}{9}$   
(B)  $\frac{1}{3}$   
(C) 3  
(D) 6  
(E) 9

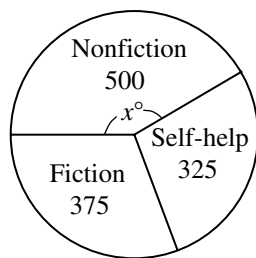
- 23** Checkers are stacked into four piles such that each pile has  $k$  more checkers than the previous pile. If the first pile contains 3 checkers, and there are 30 checkers in total in the four piles, what is the value of  $k$ ?

(A) 2  
(B) 3  
(C) 4  
(D) 5  
(E) 6

- 24** What number is equal to  $\frac{3}{5}$  of itself plus 240?

(A) 144  
(B) 280  
(C) 360  
(D) 400  
(E) 600

25

Total Sales of Different Book Genres  
(in thousands)

The pie graph above shows the book sales for a publishing company in a single year. If  $x$  represents the measure, in degrees, of the central angle of the sector representing the sales of nonfiction books, what is the value of  $x$ ?

- (A) 120
- (B) 125
- (C) 135
- (D) 145
- (E) 150

26

Set  $S$  consists of 10 consecutive even integers that have an average (arithmetic mean) of 23. Which of the following must be true?

- I. The median of set  $S$  is 23.
- II. No two integers in set  $S$  have a difference greater than 10.
- III. There are no multiples of 5 in set  $S$ .

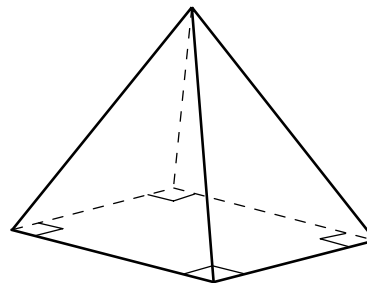
- (A) I only
- (B) II only
- (C) I and II only
- (D) I and III only
- (E) I, II, and III

27

If  $2^n = \frac{2}{2^k}$ , what is the value of  $n + k$ ?

- (A)  $-2$
- (B)  $-1$
- (C)  $0$
- (D)  $1$
- (E)  $2$

28



The pyramid in the figure above has a square base and four congruent triangular faces. If the area of the base is 144 square inches and the height of the pyramid is 8 inches, what is the area of one of the triangular faces, in square inches?

- (A) 42
- (B) 48
- (C) 60
- (D) 96
- (E) 120

4

### Directions for Student-Produced Response Questions

Each of the questions in this section requires you to solve the problem and enter your answer in a grid, as shown below.

- If your answer is  $\frac{2}{3}$  or  $.666\dots$ , you must enter **the most accurate value the grid can accommodate**, but you may do this in one of four ways:

Start in first column

2	/	3	
.	.	.	.
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

Grid result here

Start in second column

	2	/	3
.	.	.	.
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

Grid as a truncated decimal

.	6	6	6
.	.	.	.
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

Grid as a rounded decimal

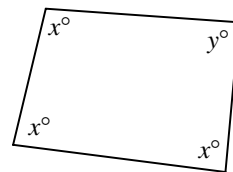
.	6	6	7
.	.	.	.
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

- In the example above, gridding a response of 0.67 or 0.66 is **incorrect** because it is less accurate than those above.
- The scoring machine cannot read what is written in the top row of boxes. You **MUST** fill in the numerical grid accurately to get credit for answering any question correctly. You should write your answer in the top row of boxes only to aid your gridding.
- Do **not** grid in a mixed fraction like  $3\frac{1}{2}$  as  $\boxed{3} \boxed{1} \boxed{/} \boxed{2}$  because it will be interpreted as  $\frac{31}{2}$ . Instead, convert it to an improper fraction like  $\frac{7}{2}$  or a decimal like 3.5 before gridding.
- None of the answers will be negative, because there is no negative sign in the grid.
- Some of the questions may have more than one correct answer. You must grid only one of the correct answers.
- You may use a calculator on any of these problems.
- All numbers in these problems are real numbers.
- Figures are drawn as accurately as possible EXCEPT when it is stated that the figure is not drawn to scale.
- All figures lie in a plane unless otherwise indicated.

29

What is the result when  $\frac{1}{4}$  of 80 is divided by  $\frac{1}{3}$  of 90?

31



Note: Figure not drawn to scale.

30

For all real numbers  $x$  and  $y$ , let  $x \oslash y$  be defined by the equation  $x \oslash y = (x + y)(x - y)$ . What is the value of  $5 \oslash 3$ ?

In the figure above, if  $x = 89$ , what is the value of  $y$ ?



- 32** If the maximum value in the range of the function  $y = f(x)$  is 6, what is the maximum value in the range of the function  $y = 3f(x - 1)$ ?

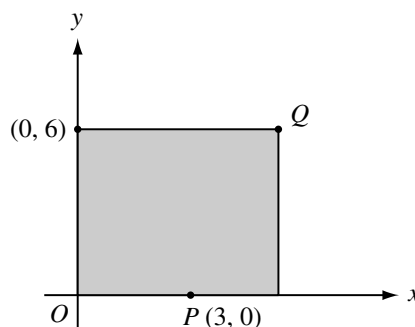
- 33**
- $$m = 4A3$$
- $$n = 7B9$$

Suppose  $m$  and  $n$  are 3-digit integers, as shown, where  $A$  and  $B$  represent digits. If  $m$  is divisible by 3 and  $n$  is divisible by 9, what is the greatest possible value of  $m + n$ ?

- 34** If  $2^{m+1} = 8^4$ , what is the value of  $m$ ?

- 35**
- $$m, n, 9, 5$$

If the product of the four numbers above is 0 and the median of these four numbers is 3.5, what is the average (arithmetic mean) of these four numbers?

**36**

*Note: Figure not drawn to scale.*

In the figure above, if the shaded rectangle has an area of 90 square units, what is the slope of line  $PQ$  (not shown)?

- 37** A water pump, working at a constant rate, fills  $\frac{2}{7}$  of a tank in  $1\frac{1}{3}$  hours. What fraction of the tank will be filled, at this rate, after 3 hours?

- 38** A box contains only red, blue, and yellow crayons. The ratio of red crayons to blue crayons is 2:3, and the ratio of blue crayons to yellow crayons is 2:1. If there is a whole number of each color of crayon in the box, what is the probability that a crayon chosen randomly from the box is blue?



**You may check your work, on this section only, until time is called.**

# ANSWER KEY

Section 1 Critical Reading	Section 3 Critical Reading	Section 2 Math	Section 4 Math	Section 5 Writing
<input type="checkbox"/> 1. B <input type="checkbox"/> 2. E <input type="checkbox"/> 3. C <input type="checkbox"/> 4. B <input type="checkbox"/> 5. A <input type="checkbox"/> 6. D <input type="checkbox"/> 7. E <input type="checkbox"/> 8. B <input type="checkbox"/> 9. B <input type="checkbox"/> 10. D <input type="checkbox"/> 11. C <input type="checkbox"/> 12. E <input type="checkbox"/> 13. D <input type="checkbox"/> 14. C <input type="checkbox"/> 15. D <input type="checkbox"/> 16. E <input type="checkbox"/> 17. E <input type="checkbox"/> 18. B <input type="checkbox"/> 19. C <input type="checkbox"/> 20. D <input type="checkbox"/> 21. D <input type="checkbox"/> 22. A <input type="checkbox"/> 23. A <input type="checkbox"/> 24. C	<input type="checkbox"/> 25. B <input type="checkbox"/> 26. C <input type="checkbox"/> 27. A <input type="checkbox"/> 28. C <input type="checkbox"/> 29. A <input type="checkbox"/> 30. D <input type="checkbox"/> 31. E <input type="checkbox"/> 32. D <input type="checkbox"/> 33. C <input type="checkbox"/> 34. E <input type="checkbox"/> 35. D <input type="checkbox"/> 36. C <input type="checkbox"/> 37. B <input type="checkbox"/> 38. D <input type="checkbox"/> 39. E <input type="checkbox"/> 40. A <input type="checkbox"/> 41. B <input type="checkbox"/> 42. C <input type="checkbox"/> 43. A <input type="checkbox"/> 44. C <input type="checkbox"/> 45. A <input type="checkbox"/> 46. B <input type="checkbox"/> 47. E <input type="checkbox"/> 48. D	<input type="checkbox"/> 1. E <input type="checkbox"/> 2. D <input type="checkbox"/> 3. D <input type="checkbox"/> 4. B <input type="checkbox"/> 5. C <input type="checkbox"/> 6. A <input type="checkbox"/> 7. A <input type="checkbox"/> 8. B <input type="checkbox"/> 9. C <input type="checkbox"/> 10. D <input type="checkbox"/> 11. B <input type="checkbox"/> 12. C <input type="checkbox"/> 13. D <input type="checkbox"/> 14. A <input type="checkbox"/> 15. C <input type="checkbox"/> 16. B <input type="checkbox"/> 17. B <input type="checkbox"/> 18. B <input type="checkbox"/> 19. E <input type="checkbox"/> 20. E	<input type="checkbox"/> 21. B <input type="checkbox"/> 22. C <input type="checkbox"/> 23. B <input type="checkbox"/> 24. E <input type="checkbox"/> 25. E <input type="checkbox"/> 26. A <input type="checkbox"/> 27. D <input type="checkbox"/> 28. C  # Right (A): _____ # Wrong (B): _____ # (A) - $\frac{1}{4}$ (B): _____  <input type="checkbox"/> 29. $\frac{2}{3}$ or .666 or .667 <input type="checkbox"/> 30. 16 <input type="checkbox"/> 31. 93 <input type="checkbox"/> 32. 18 <input type="checkbox"/> 33. 1212 <input type="checkbox"/> 34. 11 <input type="checkbox"/> 35. 4 <input type="checkbox"/> 36. $\frac{1}{2}$ or .5 <input type="checkbox"/> 37. $\frac{9}{14}$ or .642 or .643 <input type="checkbox"/> 38. $\frac{6}{13}$ or .461 or .462	<input type="checkbox"/> 1. C <input type="checkbox"/> 2. B <input type="checkbox"/> 3. E <input type="checkbox"/> 4. C <input type="checkbox"/> 5. D <input type="checkbox"/> 6. A <input type="checkbox"/> 7. E <input type="checkbox"/> 8. C <input type="checkbox"/> 9. A <input type="checkbox"/> 10. E <input type="checkbox"/> 11. C <input type="checkbox"/> 12. B <input type="checkbox"/> 13. B <input type="checkbox"/> 14. C <input type="checkbox"/> 15. D <input type="checkbox"/> 16. A <input type="checkbox"/> 17. C <input type="checkbox"/> 18. B <input type="checkbox"/> 19. E <input type="checkbox"/> 20. D <input type="checkbox"/> 21. B <input type="checkbox"/> 22. D <input type="checkbox"/> 23. C <input type="checkbox"/> 24. D <input type="checkbox"/> 25. B <input type="checkbox"/> 26. E <input type="checkbox"/> 27. A <input type="checkbox"/> 28. B <input type="checkbox"/> 29. B <input type="checkbox"/> 30. E <input type="checkbox"/> 31. B <input type="checkbox"/> 32. C <input type="checkbox"/> 33. E <input type="checkbox"/> 34. A <input type="checkbox"/> 35. A <input type="checkbox"/> 36. B <input type="checkbox"/> 37. D <input type="checkbox"/> 38. E <input type="checkbox"/> 39. E
# Right (A): _____	# Right (A): _____	# Right (A): _____	# Right (A): _____	# Right (A): _____
# Wrong (B): _____	# Wrong (B): _____	# Wrong (B): _____		# Wrong (B): _____
# (A) - $\frac{1}{4}$ (B): _____	# (A) - $\frac{1}{4}$ (B): _____	# (A) - $\frac{1}{4}$ (B): _____		# (A) - $\frac{1}{4}$ (B): _____

## SCORE CONVERSION TABLE

### How to score your test

Use the answer key on the previous page to determine your raw score on each section. Your raw score on any section is equal to the number of correct answers on that section minus 1/4 of the number of wrong answers, with the exception of the mathematical “grid-in” section, on which wrong answers are not deducted from your score. Remember to add the raw scores from Sections 1 and 3 to get your Critical Reading raw score, and to add the raw scores from Sections 2 and 4 to get your Math raw score. Write the three raw scores here:

Raw Critical Reading score (Section 1 + Section 3): \_\_\_\_\_

Raw Math score (Section 2 + Section 4): \_\_\_\_\_

Raw Writing score (Section 5): \_\_\_\_\_

Use the table below to convert these to scaled scores.

**Scaled scores:**      Critical Reading: \_\_\_\_\_      Math: \_\_\_\_\_      Writing: \_\_\_\_\_

Raw Score	Critical Reading Scaled Score	Math Scaled Score	Writing Scaled Score	Raw Score	Critical Reading Scaled Score	Math Scaled Score	Writing Scaled Score
48	80			20	49	52	54
47	80			19	48	51	52
46	78			18	47	50	51
45	76			17	46	48	50
44	74			16	45	47	49
43	72			15	44	46	48
42	71			14	43	45	46
41	69			13	42	44	45
40	68			12	41	43	44
39	67		80	11	40	42	43
38	66	80	80	10	39	41	41
37	64	77	78	9	38	40	40
36	63	74	77	8	37	39	39
35	62	72	76	7	36	38	37
34	62	70	74	6	34	36	36
33	61	68	73	5	33	35	35
32	60	66	71	4	32	34	33
31	59	65	69	3	30	32	32
30	58	64	68	2	29	30	31
29	57	62	66	1	27	29	30
28	56	61	65	0	25	26	29
27	55	60	63	-1	22	23	28
26	54	59	62	-2	20	20	27
25	54	58	60	-3	20	20	25
24	54	57	59	-4	20	20	24
23	52	55	57	-5	20	20	22
22	51	54	56	-6	20	20	21
21	50	53	55	-7 or less	20	20	20

# Detailed Answer Key

## Section I

1. **B** If the remark was only *seemingly offhand*, then it must have actually been *deliberate*. *celebrated* = famous; *calculated* = planned for deliberate effect; *reflexive* = automatic; *conventional* = conforming to custom

2. **E** The term *symbiosis* refers to a situation in which different species act in a mutually beneficial way to one another. *parasitism* = relationship in which one organism harms another by taking advantage of it; *precarious* = dangerous; *antagonism* = hostility; *beneficial* = helpful

3. **C** A career to which one feels called is a *vocation*, which derives from the Latin *vocare*, to call. *embodiment* = a representation in bodily form; *acquisition* = something acquired; *corollary* = a logical deduction

4. **B** The word *although* indicates a contrast between the fact that the value of liberty is *timeless* and the fact that our appreciation of it is not. The first word, logically, should be a synonym of *value* and the second a synonym of *temporary*. *benevolence* = kindness; *fleeting* = short-lived; *anachronisms* = things that are out of place in time; *transitory* = temporary; *diversions* = entertainments; *ephemeral* = short-lived

5. **A** This sentence contains a reiteration or definition. The missing word means *unexpected changes*. *vicissitudes* = unexpected changes; *veneers* = superficial pretenses or outward shows; *evanescence* = quality of being able to vanish quickly

6. **D** The words *by* and *thereby* indicate logical cause-and-effect relationships within the sentence. Use your common sense to complete the sentence in a logical way. What would one expect a change in global climate to do to our ancestors in trees, and what would one expect to happen to human evolution as a result of this? A change in climate would produce a change in food availability, encouraging our ancestors to climb out of the trees and to evolve. *hasten* = to cause to occur more quickly; *resolve* = solve a problem; *spur* = encourage; *impel* = force; *propel* = to push forward

7. **E** If a Senator chose to *affiliate himself with the opposition*, he would have *abandoned* his own party,

which would likely have treated him as a *traitor*. *repudiate* = to reject the validity of; *curator* = director of a museum; *recluse* = hermit; *ascertain* = determine the truth of; *complement* = something that, when added to something else, forms a whole; *expatriate* = one who lives in a country other than his or her native land; *forsake* = abandon; *apostate* = one who abandons one's party or faith

8. **B** If a dictator could not be *assuaged* (pacified), and issued *bellicose* (war-mongering) announcements, then it would seem almost impossible to avoid conflict. *diplomacy* = attempts at peaceful conciliation; *disclosed* = revealed; *conciliation* = appeasement; *averted* = prevented; *tact* = the ability to appreciate the delicacy of a situation and act appropriately; *denigrated* = defamed, disparaged; *belligerence* = antagonism, pugnaciousness; *fore-stalled* = delayed; *jingoism* = excessive and aggressive nationalism; *circumvented* = overcame through clever maneuvering

9. **B** The author states that *students [come] to us from the best high schools in America* (lines 10–11). This suggests that the author is a college professor.

10. **D** The top of the pyramid (as opposed to the rest of the pyramid) is described as the place *where the most profound questions of our era are examined* (lines 35–36).

11. **C** The author of Passage 1 states that *there seems to be no grounding* (lines 17–18) in the fundamental academic skills for college students, but suggests, through the ladder metaphor, that there should be. The author of Passage 2, however, claims that *we are losing too many students in building the pyramid* (of fundamental skills) (lines 37–38).

12. **E** The author of Passage 1 uses the ladder as a metaphor for academic learning, and the author of Passage 2 uses the pyramid as a metaphor.

13. **D** The author of Passage 1 states that he is writing *at the end of a brief introduction* (lines 7–8) and that he is *regarding most of the criticism and much of Fitzgerald's work* (lines 1–2). Therefore, he suggests that he is writing an introduction to a book of criticism.

14. **C** The author explains that in saying that *modern criticism... is... too refined* (lines 12–13), he means that *critics tend to make too much of small things* (lines 14–15).

15. **D** The author states that *there is joy in Fitzgerald's work that should not be passed over* (lines 20–21) and that Edmund Wilson, in particular, recognized this quality in Fitzgerald's work.

16. **E** In saying that *a writer... is commonly charged with having too narrow a range* (lines 29–31), he is saying that the writer is accused of dealing only with a short list of themes.

17. **E** The author suggests that examining Fitzgerald's original manuscripts, which contain *strikeovers, and pencillings, and second and third thoughts* (lines 46–47), can help a writer to appreciate that good writing involves a good deal of reworking.

18. **B** The fifth paragraph of Passage 1 expresses a concern that some Fitzgerald scholarship is *solemn and heavy* (line 51), after expressing in a previous paragraph that Fitzgerald's work is filled with *joy* (line 20). He also suggests that *there should be some licensing procedure that would prevent bad writers... from dealing with Fitzgerald* (lines 52–55). He is therefore showing a concern about the quality and tone of Fitzgerald scholarship.

19. **C** The following sentence goes on to explain that, in his earliest works, Fitzgerald's *optimistic sense of the value of experience is overshadowed by a personal intuition of tragedy* (lines 83–86). In other words, Fitzgerald's novels contain tragic elements.

20. **D** This final paragraph contrasts *those who possess the necessary means* (line 107), that is, the wealthy, with *the disinherited* (line 110), that is, the poor. When the author states that *the disinherited [are] forever barred from the white palace* (lines 110–111), he means that they do not have access to the wealth and privilege of the affluent.

21. **D** The author of Passage 1 would strongly disagree because he states, in lines 63–64, that *Fitzgerald will probably continue to claim the interest of both the general reader and the scholar-critic*.

22. **A** The *joy* mentioned in line 20 of Passage 1 is described as a feature of Fitzgerald's work that *should not be passed over* (line 21) and as something that is *exceedingly rare* (line 24) and has *worth* (line 28), but the *wonder* described in line 86 of Passage

2 is a feature of Fitzgerald's work that, the author of Passage 2 claims, is *chastened by satiric and ironic insights* (line 87). In other words, the author of Passage 1 considers this quality to be a unique and worthy feature of Fitzgerald's work, while the author of Passage 2 considers it to be compromised by intimations of tragedy.

23. **A** The author of Passage 1 suggests that some criticism dwells *upon profundities, complexities, and tragic implications* (lines 21–23) in Fitzgerald's work. The author of Passage 2 states that Fitzgerald's works have been *labeled... by their most recent critics, as darkly pessimistic studies* (lines 74–75).

24. **C** The author of Passage 1 states in the third paragraph, as well as in the fifth, that critics dwell excessively on *profundities, complexities, and tragic implications* (lines 22–23) in Fitzgerald's works, and that too much scholarship on Fitzgerald has become *solemn and heavy* (line 51). He emphasizes Fitzgerald's *extraordinary felicity of expression* (line 62) and suggests that good criticism of Fitzgerald should be likewise felicitous, not heavy and tragic.

## Section 2

1. **E** The area of a rectangle is given by the formula  $A = bh$ , and the area of a triangle is given by the formula  $A = \frac{1}{2}bh$ . So the rectangle has an area of  $(4)(6) = 24$ , and the triangle has an area of  $\frac{1}{2}(4)(4) = 8$ . So the area of the rectangle is 3 times the area of the triangle.

(Chapter 11 Lesson 5: Areas and Perimeters)

2. **D**

The algebraic method:  $x = 2y + 2$   
 Multiply by 6:  $6x = 12y + 12$

This equation states that  $6x$  is 12 more than  $12y$ . (Don't forget to *distribute* the multiplication on the right-hand side!)

Although the algebraic method is the simplest, and should be easy to understand, you can also solve this by simply choosing values for  $x$  and  $y$  that work in the original equation. For instance, if  $x = 2y + 2$ , then  $x$  could be 4 and  $y$  could be 1, because  $4 = 2(1) + 2$ . The question *how much greater is  $6x$  than  $12y$*  now becomes *how much greater is  $6(4)$  than  $12(1)$*  or *how much greater is 24 than 12*? The answer is clearly  $24 - 12 = 12$ .

(Chapter 9 Lesson 1: Solving Equations)

(Chapter 9 Lesson 2: Systems)

(Chapter 8 Lesson 2: The Laws of Arithmetic)

3. **D** First, notice that any number that is divisible by 6 must necessarily be divisible by 2 also, since  $6 = (3)(2)$ . Therefore, the question is simply asking: how many multiples of 6 are there between 10 and 40? The answer choices quickly tell you that the answer can be no more than 6, so it's easy enough to list them: 12, 18, 24, 30, 36.

(Chapter 8 Lesson 7: Divisibility)

4. **B** First notice that 100 hours is a little bit more than 4 days, because  $100 \text{ hours} \times (1 \text{ day}/24 \text{ hours}) = 4 \frac{1}{6} \text{ days}$ , or 4 days and 4 hours. Since 4 days later it will be 4:30 p.m. again, in 4 days and 4 hours it will be 8:30 p.m.

(Chapter 7 Reasoning Skill 3: Finding Patterns)

5. **C** To use the algebraic method, start by defining  $d$  as the number of candy bars that Denise sold (since this is what the question is asking for). If Emily sold four times as many candy bars as Denise, then Emily sold  $4d$  candy bars. If Denise sold 3 times as many as Carrie, then Carrie sold  $\frac{1}{3}d$  candy bars. Since they sold 48 altogether,

$$d + 4d + \frac{1}{3}d = 48$$

$$\text{Simplify:} \quad (16/3)d = 48$$

$$\text{Multiply by } 3/16: \quad d = 9$$

Alternatively, you can simply “test” the answer choices and work by process of elimination. Remember that if you “work backward” like this, you should always start with the middle value, which is almost always at (C). You would simply check whether, if Denise sold 9 candy bars, the total would come out to 48. It does, because Emily would have sold  $(4)(9) = 36$ , and Carrie would have sold  $\frac{1}{3}(9) = 3$ , and  $9 + 36 + 3 = 48$ .

(Chapter 9 Lesson 7: Word Problems)

6. **A** Remember that a straight angle has a measure of  $180^\circ$ . Therefore

$$2x + 3x = 180$$

$$\text{Simplify:} \quad 5x = 180$$

$$\text{Divide by } 5: \quad x = 36$$

Since the  $y^\circ$  angle is “vertical” with the  $2x^\circ$  angle, the two must be congruent, so  $y = 2x = 2(36) = 72$ .

(Chapter 11 Lesson 1: Lines and Angles)

7. **A** The brute force method is to simply evaluate  $2x - x^2$  for each of the “input” values until you get a positive result. It's a bit easier, though, to simply factor the expression and pay attention to the signs of the factors. First, factor the function expression:  $f(x) = 2x - x^2 = x(2 - x)$ . Now check the signs:

$$x \quad (2 - x) \quad x(2 - x)$$

$$(A) \ x = 0.5 \quad + \quad + \quad +$$

$$(B) \ x = 0 \quad 0 \quad + \quad 0$$

$$(C) \ x = -0.5 \quad - \quad + \quad -$$

$$(D) \ x = -1.5 \quad - \quad + \quad -$$

$$(E) \ x = -2.5 \quad - \quad + \quad -$$

(Chapter 9 Lesson 5: Factoring)

(Chapter 10 Lesson 1: New Symbol or Term Problems)

8. **B** You might start by noticing that the line contains the points (0, 3) and (6, 0). Remember that the slope of the line is simply the “rise” between two points divided by the “run” between those same two points. If you walk from (0, 3) to (6, 0), your “run” would be  $6 - 0 = 6$ , and your “rise” would be  $0 - 3 = -3$ . Therefore the slope of this line is  $-3/6 = -1/2$ . Now look at the choices. Notice that all of the equations are in the form  $y = mx + b$ , and in this form  $m$  stands for the slope, and  $b$  stands for the  $y$ -intercept. Since the  $y$ -intercept is clearly 3, the correct equation is (B).

Alternatively, you can just “plug in” the points (0, 3) and (6, 0) to the equations, and eliminate any equations that aren't true for both points. For instance:

Plug in (0, 3)

Plug in (6, 0)

$$(A) \ 3 = -2(0) + 3 \quad (\text{Yes}) \quad 0 = -2(6) + 3 \quad (\text{No})$$

$$(B) \ 3 = -1/2(0) + 3 \quad (\text{Yes}) \quad 0 = -1/2(6) + 3 \quad (\text{Yes})$$

$$(C) \ 3 = -1/2(0) + 6 \quad (\text{No}) \quad 0 = -1/2(6) + 6 \quad (\text{No})$$

$$(D) \ 3 = 1/2(0) + 3 \quad (\text{Yes}) \quad 0 = 1/2(6) + 3 \quad (\text{No})$$

$$(E) \ 3 = 2(0) + 6 \quad (\text{No}) \quad 0 = 2(6) + 6 \quad (\text{No})$$

(Chapter 11 Lesson 4: Coordinate Geometry)

9. **C** You can use simple algebra or plug in a value for  $b$ , whichever is easier. If  $g$  is the total number of girls in the class, and “the number of girls is 6 less than twice the number of boys,” then  $g = 2b - 6$ . The total number of students in the class, therefore, is  $b + g = b + (2b - 6) = 3b - 6$ . But if 2 girls are absent, the number of students present is  $3b - 6 - 2 = 3b - 8$ .

Alternatively, you could just pick a simple value for  $b$ , like 10. If the number of girls is 6 less than twice the number of boys, then there are  $20 - 6 = 14$  girls, for a total of  $10 + 14 = 24$  students. If 2 are absent, there must be 22 present. Notice that choice (C) is the only one that gives a value of 22 when you plug in 10 for  $b$ .

(Chapter 9 Lesson 7: Word Problems)

10. **D**

$$(x + 5)^2 = 0$$

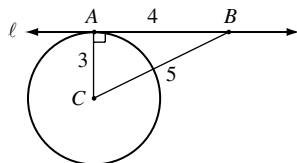
$$\text{Take the square root:} \quad (x + 5) = 0$$

$$\text{Subtract 5:} \quad x = -5$$

Therefore  $(x - 1)(x + 1) = (-5 - 1)(-5 + 1) = (-6)(-4) = 24$

(Chapter 10 Lesson 3: Numerical Reasoning Problems)

11. **B** Be sure to mark up the diagram with the information you are given and the information you can deduce:



Remember that the formula for the circumference of a circle is  $c = 2\pi r$ . Since the circumference of the circle is  $6\pi$ ,

$$6\pi = 2\pi r$$

$$\text{Divide by } 2\pi: \quad 3 = r$$

Also, recall that any tangent to a circle is perpendicular to the radius that touches the point of tangency. Therefore,  $\triangle ABC$  is a right triangle with legs of 3 and 4. To find  $BC$ , the hypotenuse, you might notice that this is the common 3-4-5 triangle, or you can simply use the Pythagorean theorem:

$$3^2 + 4^2 = (BC)^2$$

$$\text{Simplify:} \quad 25 = (BC)^2$$

$$\text{Take the square root:} \quad 5 = BC$$

(Chapter 11 Lesson 8: Circles)

(Chapter 11 Lesson 3: The Pythagorean Theorem)

12. **C** Since the integers are consecutive and their sum is  $-10$ , you might be able to find them simply by guessing and checking. Or if you prefer, you can find them algebraically. Just call the least of the integers  $x$ . Then, the statement that the five consecutive integers have a sum of  $-10$  becomes

$$x + (x + 1) + (x + 2) + (x + 3) + (x + 4) = -10$$

$$\text{Simplify:} \quad 5x + 10 = -10$$

$$\text{Subtract 10:} \quad 5x = -20$$

$$\text{Divide by 5:} \quad x = -4$$

Therefore the five numbers are  $-4$ ,  $-3$ ,  $-2$ ,  $-1$ , and  $0$ . Now you are to find the greatest possible *product* of *three* of these numbers. All the numbers are negative except  $0$ . The product of any three negatives is always negative, but the product of any number and  $0$  is always  $0$ . Therefore, the greatest product you can get by multiplying three of these numbers is  $0$ .

(Chapter 10 Lesson 3: Numerical Reasoning Problems)

13. **D** Just focus on the Wednesdays. Since the first of the month is a Monday, the first Wednesday

must be the 3rd. Since Wednesdays happen to occur every 7 days, the other Wednesdays are on the 10th, 17th, and 24th. (There is no 31st because there are only 30 days.) Therefore 4 of the 30 days are Wednesdays, so the probability is  $4/30 = .1333\dots$

(Chapter 10 Lesson 3: Numerical Reasoning Problems)

(Chapter 7 Reasoning Skill 3: Finding Patterns)

14. **A** Remember that  $|x|$  means the distance from  $x$  to  $0$  on the number line. So if  $|x| > 2$ , then either  $x > 2$  or  $x < -2$ . (Think about it.) So two simple *possible* values of  $x$  are  $3$  and  $-3$ . If  $x$  can be  $-3$ , then statements I and III are not necessarily true since  $-3 > 0$  is not true and  $(-3)^3 > 2$  is not true. If you eliminate every answer choice that contains statement I or statement III, you are left only with (A). Statement II must be true because if you square both sides of  $|x| > 2$ , you get  $x^2 > 4$ , and if  $x^2$  is greater than  $4$ , it must certainly also be greater than  $2$ .

(Chapter 9 Lesson 6: Inequalities, Absolute Values, and Plugging In)

15. **C** Since marbles only come in whole numbers, if the number of red marbles is  $5/6$  the number of white marbles, then the number of red marbles must be a multiple of  $5$ . (Just think of the ways it could happen:  $5$  red and  $6$  white,  $10$  red and  $12$  white, etc.) Likewise, if the number of red marbles is  $6/7$  the number of blue marbles, then the number of red marbles must also be a multiple of  $6$ . Since the smallest multiple of  $5$  and  $6$  is  $30$ , this is the least possible number of red marbles. Since the number of red marbles is  $5/6$  the number of white marbles,

$$30 = (5/6)w$$

$$\text{Multiply by } 6/5: \quad 36 = w$$

Since the number of red marbles is  $6/7$  the number of blue marbles,

$$30 = (6/7)b$$

$$\text{Multiply by } 7/6: \quad 35 = b$$

So the least possible total number of marbles is  $30 + 36 + 35 = 101$ .

(Chapter 8 Lesson 3: Fractions)

(Chapter 8 Lesson 4: Ratios and Proportions)

16. **B** A sequence in which each term is equal to the previous term times a constant (a fixed number) is called a *geometric* sequence. The number you must multiply each time is the common ratio,  $b/a$ , which is also equal to  $a/8$  and  $27/b$ . You might simply test the answer choices, starting with (C), to see how the sequence works out. For instance, testing (C)  $3.375$  means multiplying the first term,





(Chapter 11 Lesson 1: Lines and Angles)  
 (Chapter 11 Lesson 4: Coordinate Geometry)  
 (Chapter 11 Lesson 6: Similar Figures)

### Section 3

25. **B** If Harold is *unlike* other farmers, then he thinks of rain as something contrasting a *benefit*. *hardship* = a trying situation

26. **C** A *perfectionist* is one who cannot accept flaws in his or her work. Therefore, the tendency to destroy works that are less than perfect would be a hallmark of perfectionism. *paragon* = prime example; *mediocre* = of average quality; *proponent* = supporter, advocate; *aesthetic* = relating to a sense of the beautiful; *advocate* = one who speaks out for a cause; *monetary* = pertaining to money

27. **A** Clearly, Joseph has the tendency to *pick fights*. *belligerence* = eagerness to fight; *diligence* = persistent application to one's work; *fortitude* = strength; *restraint* = ability to control one's urges; *eloquence* = ability to speak fluently and persuasively

28. **C** *Discounted merchandise and free gift wrapping* are things that are likely to appeal to shoppers. If the shoppers were *angry*, such offers seem to be attempts to *appease* their anger. *exculpate* = free from blame; *impede* = hinder the progress of; *mollify* = appease, soothe the anger of; *pilfer* = steal; *abridge* = to shorten the length of a written work

29. **A** *Severe immigration restrictions* would logically render a country *less vulnerable* to foreign terrorists, but would also *hinder* the *influx* (inward flow) of creative ideas. *pervious* = penetrable; *stem* = stop the flow of; *impregnable* = incapable of being penetrated; *hasten* = to cause to happen sooner; *potent* = strong

30. **D** This passage compares and contrasts *two kinds of evidence* (lines 5–6) in history: *oral traditions and archaeology* (lines 4–5).

31. **E** The *nonmaterial world of ideas, values and beliefs* (lines 15–16) is said to be provided by *oral sources* (line 14). This *nonmaterial world*, according to the passage, is worthy of study but only ascertainable through oral traditions.

32. **D** The overall purpose of the passage is to criticize irrationality. The first sentence characterizes the *irrational tidal waves of the last big war* (lines 2–3) as causing *agony and despair*. It then goes on to bemoan the fact that *man is not rational enough*

(lines 12–13) to take advantage of recent advancements and that reality *does not conform to our rational prescriptions* (line 22).

33. **C** The parenthetical comment states that the poor *might have most reason for such reactions* (as unrest and violence). In other words, the poor are the most justified in acting rebelliously.

34. **E** The author states *I go off down to the river to get my strength back* (lines 28–29). In other words, the river rejuvenates him.

35. **D** The author states that *without that "everything," I can't get along either*. The "everything" that he is referring to is the *traffic* (line 4), which he says gets on his nerves, and the *people and things* (lines 16–17) that he encounters every day. In other words, he needs these things, but occasionally needs to get away from them also.

36. **C** The *thing that we haven't managed to pull out of our dusty old dictionaries* (lines 27–28) is the *recreation* (line 22) or the *rest [that helps one to get one's] strength back regularly* (line 26), in other words, something that helps to restore one's strength.

37. **B** The *constant flight from open conflict* (lines 66–67) is the *escape from or fleeing from conflict*.

38. **D** The author states that work has *lost its original meaning long since its primeval, ennobling, creative function* (lines 72–73). In other words, long ago work was meant as a creative endeavor, and it has lost its meaning as such.

39. **E** This paragraph describes how the author's *appointment with the river has expired* (lines 83–84) because the city is *waking up* (line 82) behind him. The *pensioners* (line 90) are mentioned as examples of those people and things that are intruding on his solitude at the river.

40. **A** The passage as a whole describes the conflict that the narrator feels between his need for *people and things* (lines 16–17) and the tendency of these things to occasionally *get [him] down* (line 17), whereupon he seeks solitude and rejuvenation at the river. Therefore, the main conflict is between solitude and sociability.

41. **B** The first line of the passage states that *according to Kant, his reading of David Hume awakened him from his dogmatic slumber and set him on*

the road to becoming the “critical philosopher” (lines 1–4). In other words, Hume’s writings inspired Kant in his philosophical thinking.

42. **C** The term *dogmatic* means very rigid and preachy in one’s views. By saying that he was *awakened... from his dogmatic slumber* (lines 2–3), the author is stating that Kant was far more rigid in his thinking before reading the work of David Hume.

43. **A** The passage states that the *theme* (line 35) of the “Transcendental Dialectic” is *this inevitable failure* (lines 35) of *all theoretical attempts to know things-in-themselves* (lines 33–34).

44. **C** According to the passage, in *Critique of Pure Reason*, Kant *shows the necessity of a belief in [the existence of God, freedom, and immortality] in his moral philosophy* (lines 43–45). In other words, Kant’s moral system required the belief in free will.

45. **A** According to the passage, Kant’s *categorical imperative* (lines 46–47) is to “*Act as if the maxim from which you act were to become through your will a universal law*” (lines 47–49). In other words, act as if the principles behind your acts were the principles that everyone used; that is, they applied to all human beings.

46. **B** The author states that, according to Kant, *we do not act infallibly in accordance with [the categorical imperative]* (lines 53–54) because *we almost always act according to inclination* (lines 55–56); that is, we do what our subjective needs and desires compel us to do. Another way of saying this is that our acts are necessarily *subjectively contingent* (line 58), that is, we can only act according to our “subjective” needs and desires, so we cannot do infallibly what is *objectively necessary* (line 57).

47. **E** The *bridge* (line 73) is one *between the sensible and the intelligible worlds* (line 69), so it is a bridge between what can be sensed and what can be understood.

48. **D** The final paragraph describes what Kant *went on to state* in *Critique of Practical Reason*. It then summarizes another later work of Kant, the *Critique of Judgment*.

## Section 4

21. **B** A square with perimeter of 20 centimeters must have sides of length  $20 \div 4 = 5$  centimeters.

Since the area for a square is given by the formula  $A = s^2$ , the area of the square is  $5^2 = 25$  square centimeters, and one-half of 25 is 12.5.

(Chapter 11 Lesson 5: Areas and Perimeters)

22. **C** You can solve this one algebraically or by simply testing the choices. To solve algebraically, translate into an equation. If the number is equal to  $1/3$  of its square,

$$\begin{array}{ll} & x = (1/3)x^2 \\ \text{Multiply by 3:} & 3x = x^2 \\ \text{Subtract } 3x: & 0 = x^2 - 3x \\ \text{Factor:} & 0 = x(x - 3) \\ \text{Use the 0 product property:} & x = 0 \text{ or } x = 3 \end{array}$$

Since 0 is not among the choices, the answer must be (C) 3.

Alternatively, you can simply test the choices, taking one-third of the square of each number until you get a result that equals the original number. Of course, that works with 3 because  $3 = (1/3)(3^2)$ .

(Chapter 9 Lesson 1: Solving Equations)

23. **B** This one is probably most easily solved algebraically. Since each pile has  $k$  more checkers than the previous pile and the first pile has 3 checkers, the piles have 3,  $3 + k$ ,  $3 + 2k$ , and  $3 + 3k$  checkers, respectively. Since the total number of checkers is 30,

$$\begin{array}{ll} 3 + (3 + k) + (3 + 2k) + (3 + 3k) = 30 & \\ \text{Simplify:} & 12 + 6k = 30 \\ \text{Subtract 12:} & 6k = 18 \\ \text{Divide by 6:} & k = 3 \end{array}$$

(Chapter 9 Lesson 7: Word Problems)

24. **E** If a number is equal to  $3/5$  of itself plus 240,

$$\begin{array}{ll} & x = (3/5)x + 240 \\ \text{Subtract } (3/5)x: & (2/5)x = 240 \\ \text{Multiply by } 5/2: & x = 600 \end{array}$$

(Chapter 9 Lesson 1: Solving Equations)

(Chapter 9 Lesson 7: Word Problems)

25. **E** The total number of books sold (in thousands) is  $500 + 325 + 375 = 1,200$ . Since 500 nonfiction books have been sold, and  $x$  corresponds to the central angle of the sector representing nonfiction

books, you can set up a proportion:

$$\begin{array}{rcl} \frac{\text{Part}}{\text{Whole}} & = & \frac{500}{1,200} = \frac{x}{360} \\ \text{Cross-multiply:} & & 180,000 = 1,200x \\ \text{Divide by 1,200:} & & 150 = x \end{array}$$

(Chapter 8 Lesson 4: Ratios and Proportions)

**26. A** It's helpful to know that if a set of numbers is evenly spaced, its median always equals its average (arithmetic mean). Since 10 consecutive even integers are certainly evenly spaced, statement I must be true. [This eliminates choice (B).] To check statements II and III, you should take a closer look at set S. You can find the 10 numbers fairly easily by using what we just deduced, namely, that 23 must be the median, and so it splits the set in half. Therefore set S must consist of the five even integers just before 23 and the five even integers just after 23:

14, 16, 18, 20, 22, 24, 26, 28, 30, and 32

Clearly the difference between 32 and 14 is greater than 10, so statement II is not true. Also, set S contains two multiples of 5: 20 and 30. Therefore, statement III is not true, and the answer is (A).

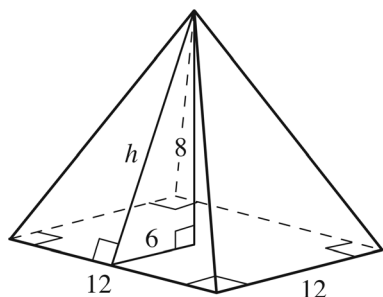
(Chapter 10 Lesson 2: Mean/Median/Mode Problems)

**27. D**

$$\begin{array}{rcl} & & 2^n = \frac{2}{2^k} \\ \text{Multiply by } 2^k: & (2^n)(2^k) & = 2 \\ \text{Simplify:} & 2^{n+k} & = 2^1 \\ \text{Equate exponents:} & n + k & = 1 \end{array}$$

(Chapter 9 Lesson 3: Working with Exponents)

**28. C** Since the area of the square base is 144, the length of one side of the square must be  $\sqrt{144} = 12$ . This is also the base of one of the triangular faces. Let's call the height of this triangular face  $h$ . Notice that  $h$  is also the hypotenuse of a right triangle with legs of 6 and 8. (One leg is the height of the pyramid, which we know is 8, and the other leg is half the length of the side of the square.)



Next, notice that this right triangle is simply a multiple of a 3-4-5 triangle, so its sides have length 6-8-10. Alternatively, you can use the Pythagorean theorem to find  $h$ :

$$\begin{array}{rcl} & & 6^2 + 8^2 = h^2 \\ \text{Simplify:} & & 36 + 64 = h^2 \\ \text{Simplify:} & & 100 = h^2 \\ \text{Take the square root:} & & 10 = h \end{array}$$

Thus the triangular face has a base of 12 and a height of 10, so its area is  $(1/2)(12)(10) = 60$  square inches.

(Chapter 11 Lesson 3: The Pythagorean Theorem)

(Chapter 11 Lesson 5: Areas and Perimeters)

(Chapter 11 Lesson 7: Volumes and 3-D Geometry)

**29.  $2/3$  or .666 or .667**

$1/4$  of 80 is  $(1/4)(80) = 20$  and  $1/3$  of 90 is  $(1/3)(90) = 30$ .  $20 \div 30 = 2/3$  or .666...

(Chapter 8 Lesson 1: Numbers and Operations)

**30. 16**

Using the definition,  $5 \circ 3 = (5 + 3)(5 - 3) = (8)(2) = 16$ .

(Chapter 7 Reasoning Skill 1: Finding Patterns)

**31. 93** Recall that the sum of the angles in a quadrilateral is always  $360^\circ$ , because a diagonal divides the quadrilateral into two triangles with  $180^\circ$  each. Therefore

$$\begin{array}{rcl} & & x + x + x + y = 360 \\ \text{Substitute:} & 89 + 89 + 89 + y & = 360 \\ \text{Simplify:} & 267 + y & = 360 \\ \text{Subtract 267:} & & y = 93 \end{array}$$

(Chapter 11 Lesson 2: Triangles)

**32. 18** We know that, for some value of  $x$ ,  $f(x) = 6$ , and this is the largest possible output of the function. Let's say that the value of  $x$  for which this is true is 1, so that  $f(1) = 6$ . Now we are asked to find the greatest possible value of  $3f(x - 1)$ . Notice that if we substitute  $x = 2$ , we get  $3f(2 - 1) = 3f(1) = 3(6) = 18$ . Since the value of  $f(x)$  can be no greater than 6, this must be the greatest possible value of  $3f(x - 1)$ .

(Chapter 10 Lesson 1: New Symbol or Term Problems)

**33. 1,212** It is convenient to know that if a number is divisible by 3, the sum of its digits will also be a multiple of 3. Likewise, if a number is divisible by 9, the sum of its digits will also be a multiple of 9. (Don't generalize this to any other factors, though; this is only true for numbers divisible by 3 or 9. For instance, the sum of the digits of a multiple of 5, like 25, is NOT necessarily a multiple of 5.) Therefore, we know that  $4 + A + 3 = 7 + A$  is a

multiple of 3. The largest  $A$  could be, then, is 8, because  $7 + 8 = 15$  is a multiple of 3. Also,  $7 + B + 9 = 16 + B$  is a multiple of 9, so the largest  $B$  could be is 2, since  $16 + 2 = 18$  is a multiple of 9. (Remember that  $A$  and  $B$  represent single digits.) Therefore, the greatest that  $m + n$  could be is  $483 + 729 = 1,212$ .

(Chapter 8 Lesson 7: Divisibility)

34. **11**

$$\begin{array}{ll} \text{Write 8 as a power of 2:} & 2^{m+1} = 8^4 \\ \text{Simplify:} & 2^{m+1} = (2^3)^4 \\ \text{Equate the exponents:} & m + 1 = 12 \\ \text{Subtract 1:} & m = 11 \end{array}$$

(Chapter 9 Lesson 3: Working with Exponents)

35. **4** If the product of four numbers is 0, then one of the numbers must be 0. If the median of the numbers is 3.5, then two of the numbers must be greater than 3.5, and two of the numbers must be less than 3.5. So, in increasing order, the numbers are 0,  $n$ , 5, 9. Since the median is the average of the two middle numbers,

$$\begin{array}{ll} & (n + 5)/2 = 3.5 \\ \text{Multiply by 2:} & n + 5 = 7 \\ \text{Subtract 5:} & n = 2 \end{array}$$

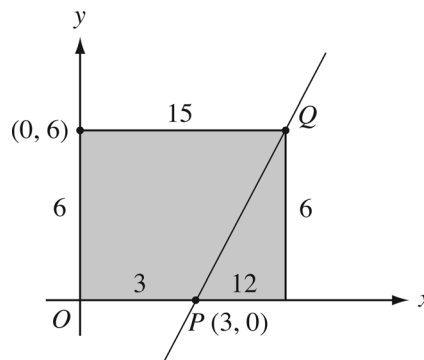
So the average (arithmetic mean) of the four numbers is  $(0 + 2 + 5 + 9)/4 = 16/4 = 4$ .

(Chapter 10 Lesson 2: Mean/Median/Mode Problems)

36. **1/2 or .5** Notice first that the height of the rectangle is 6. The area of a rectangle is given by the formula  $A = bh$ , so if the area of the rectangle is 90, then

$$\begin{array}{ll} & 90 = 6b \\ \text{Divide by 6:} & 15 = b \end{array}$$

So the base is 15. Write this into the diagram. The distance from  $O$  to  $P$  is 3, so the other part of the base is  $15 - 3 = 12$ . The slope of line  $PQ$  is the “rise” divided by the “run,” which is  $6/12 = 1/2$ . Also, you can use the slope formula  $\text{slope} = (y_2 - y_1)/(x_2 - x_1)$  with the two points on the line  $(3, 0)$  and  $(15, 6)$ :  $(6 - 0)/(15 - 3) = 6/12 = 1/2$ .



(Chapter 11 Lesson 6: Similar Figures)

37. **9/14 or .642 or .643** The phrase *at this rate* indicates that you can set up a proportion of equivalent rates:

$$\begin{array}{l} \frac{\frac{2}{7} \text{ tank}}{1\frac{1}{3} \text{ hours}} = \frac{x \text{ tank}}{3 \text{ hours}} \\ \text{Simplify mixed number:} \quad \frac{\frac{2}{7} \text{ tank}}{\frac{4}{3} \text{ hours}} = \frac{x \text{ tank}}{3 \text{ hours}} \end{array}$$

$$\begin{array}{ll} \text{Cross-multiply:} & (3)\left(\frac{2}{7}\right) = \left(\frac{4}{3}\right)x \\ \text{Simplify:} & \frac{6}{7} = \frac{4x}{3} \\ \text{Multiply by 21:} & 18 = 28x \\ \text{Divide by 28:} & 18/28 = x \\ \text{Simplify:} & 9/14 = x \end{array}$$

(Chapter 10 Lesson 4: Rate Problems)

38. **6/13 or .461 or .462** Since there is a whole number of crayons in the box, saying that the ratio of red crayons to blue crayons is 2:3 implies that the number of red crayons is a multiple of 2 and the number of blue crayons is a multiple of 3. Likewise, saying that the ratio of blue crayons to yellow crayons is 2:1 implies that the number of blue crayons is a multiple of 2 and the number of yellow crayons is a multiple of 1. So, the number of blue crayons must be a multiple of both 2 and 3. The smallest such number is 6, so let's assume that there are 6 blue crayons in the box. Since  $r:6 = 2:3$ , there must be 4 red crayons in the box, and since  $6:y = 2:1$ , there must be 3 yellow crayons in the box. Therefore, there are  $6 + 4 + 3 = 13$  crayons in the box, and since 6 of them are blue, the probability of choosing a blue

at random is 6/13.

(Chapter 10 Lesson 5: Counting Problems)

(Chapter 10 Lesson 6: Probability Problems)

(Chapter 8 Lesson 4: Ratios and Proportions)

## Section 5

1. **C** The first phrase of the sentence, which is not underlined (and therefore cannot be changed), modifies things that are *used intelligently*. The law of proximity says that these things should follow the modifying phrase. The context of the sentence indicates that these things are *mnemonics* (not *you* or *facts*), and so (C) is the best choice.

(Chapter 13 Lesson 8: Other Misplaced Modifiers)

2. **B** The original sentence contains no verb. The core of the sentence should state that *the annual conference ... was dedicated to ... resolving disputes*. Choices (B), (D), and (E) make this correction, but since choices (D) and (E) contain errors in idiom—*dedicated for* and *dedicated toward* instead of *dedicated to*—the best choice is (B).

(Chapter 13 Lesson 2: Trimming Sentences)

(Chapter 13 Lesson 10: Idiom Errors)

3. **E** The original sentence is unnecessarily wordy and suggests that *the doctor was a time*, which is illogical. Choice (E) uses 70% fewer words to say everything that the original phrase is trying to say, and so is much better.

(Chapter 13 Lesson 12: Other Problems with Modifiers)

4. **C** The original “sentence” is not a complete thought, because it lacks a verb. It is also needlessly wordy: why say *because of the fact that* when *because* will do? Choice (C) is the most concise, yet expresses a clear and complete thought.

(Chapter 13 Lesson 12: Other with Modifiers Problems)

(Chapter 13 Lesson 15: Coordinating Ideas)

5. **D** This sentence has the structure *A is B*, where *A* is *one aspect of the play*. Therefore, *B* must be a phrase that is logically and grammatically equivalent to *one aspect of the play*. As it stands, *B* is an independent clause, but should be a noun phrase, because *A* is a noun phrase. Choices (D) and (E) are noun phrases, but choice (E) suggests that the *social issue*, rather than the *play*, is *humorous*. Therefore, the best choice is (D).

(Chapter 13 Lesson 15: Coordinating Ideas)

6. **A** The original phrasing is clear, complete, logical, and concise.

7. **E** The Senator has completed campaigning, since she is now *home with her family*. Therefore, the present participle *campaigning* is incorrect and should instead be the present perfect participle: *having campaigned*.

(Chapter 13 Lesson 9: Tricky Tenses)

8. **C** This sentence contains the parallel phrasing *not so much A as B*, and so *A* and *B* must have the same grammatical structure. Since *A* is the common noun phrase *a suspense thriller*, *B* should also be a common noun phrase, as in choice (C).

(Chapter 13 Lesson 3: Parallelism)

9. **A** The original phrasing is clear, complete, logical, and concise.

10. **E** Since the sentence suggests that Jermaine was playing at that time, and as if he had played over an extended time in the past, the tense should be the past perfect progressive: *had been playing*.

(Chapter 13 Lesson 9: Tricky Tenses)

11. **C** This sentence lists the factors that influence the price of crude oil, and so the items in this list should follow the law of parallelism. The first two items in the list have the form “*something in something*”: *advancements in technology* and *patterns in the weather*, so the third item should have the same form: *changes in the global political climate*. Also, choice (C) is the most concise of the choices.

(Chapter 13 Lesson 3: Parallelism)

12. **B** The *Mississippi Pastoral*, since it is italicized, must be the title of something. The context of the sentence makes it clear that it must be one of the *symphonies* performed in the festival. This modifying phrase is so far from the word it modifies, however, that its meaning is unclear. Choice (B) moves this phrase closer to the word it modifies, and so is the best choice.

(Chapter 13 Lesson 8: Other Misplaced Modifiers)

13. **B** The sentence shows a contrast between a fact and a misconception. All of the choices indicate this contrast in some way, but only choice (B) uses the correct idiom: it *originated in* China and so did not *originate in* Italy.

(Chapter 13 Lesson 5: Pronoun Agreement)

14. **C** The sentence indicates that the students do two things, so these should have parallel phrasing.

The course requires that *students work* and that *students discuss*.

(Chapter 13 Lesson 3: Parallelism)

15. **D** The opening phrase is a participial phrase that modifies *Brice*, and not *Brice's stubbornness*, so the original phrase dangles. Choices (C) and (D) correct the dangling problem, but (D) is the only one that is phrased logically.

(Chapter 13 Lesson 7: Dangling and Misplaced Participles)

16. **A** The original phrasing is clear, complete, logical, and concise.

17. **C** The original "sentence" does not convey a complete thought because it does not contain a verb. Choice (C) corrects this problem most concisely.

(Chapter 13 Lesson 2: Trimming Sentences)

18. **B** The original phrasing is unidiomatic. The seat belts do not save lives *for* people, but save the lives *of* people. Choice (B) is the most concise yet idiomatic choice.

(Chapter 13 Lesson 10: Idiom Errors)

19. **E** The original phrasing is not parallel. If the demand increases *as the value of the dollar increases*, then it also increases *as trade barriers are lowered*.

(Chapter 13 Lesson 3: Parallelism)

20. **D** As it is originally phrased, the sentence is a run-on, because two independent clauses are joined with only a comma. By changing this phrasing to that in choice (D), the second clause becomes dependent, and this fixes the problem. Choice (C) also creates a dependent clause, but it is illogical—officials are people, not things.

(Chapter 13 Lesson 15: Coordinating Ideas)

21. **B** Since the *dumbwaiter* is only one thing, choice (B) should be changed to *which has been*.

(Chapter 13 Lesson 5: Pronoun Agreement)

22. **D** Since the closing happened after the rush of investors, the use of the perfect infinitive *to have closed* is illogical. It should be changed to *to close*.

(Chapter 13 Lesson 9: Tricky Tenses)

23. **C** This sentence suggests the parallel phrasing *not only A but also B*. This requires changing choice (C) to *but also*.

(Chapter 13 Lesson 3: Parallelism)

24. **D** The subject of the sentence is *geometric design*, which is singular. Therefore the verb should be *attests to*.

(Chapter 13 Lesson 1: Subject-Verb Disagreement)

25. **B** The word *tactful* means *sensitive to the needs of others in delicate social situations*, and so is illogical in this context. The correct word here is *tactical*, which means *pertaining to tactics*.

(Chapter 13 Lesson 11: Diction Errors)

26. **E** This sentence is correct.

27. **A** The phrase *usually never* is logically contradictory. More logical phrasings that convey the right idea are *hardly ever* or *almost never*.

(Chapter 13 Lesson 12: Other Problems with Modifiers)

28. **B** The correct phrasing is *as she (is)* because the pronoun is the subject of an implied verb

(Chapter 18 Lesson 6: Pronoun Case)

29. **B** The word should be *cleanly*, because it is an adverb modifying the verb *burns*.

(Chapter 13 Lesson 12: Other Problems with Modifiers)

30. **E** The sentence is correct.

31. **B** The subject of the verb is *ministers*, which is plural. The correct verb conjugation, then, is *have*.

(Chapter 13 Lesson 1: Subject-Verb Disagreement)

32. **C** This phrase is the antecedent of the pronoun *it*, which is singular. Therefore it should be *the fax machine*.

(Chapter 13 Lesson 5: Pronoun Agreement)

33. **E** The sentence is correct.

34. **A** The subject of the verb is *two oxygen tanks*, which is plural. The correct phrasing, then, is *there are*.

(Chapter 13 Lesson 1: Subject-Verb Disagreement)

35. **A** The pronoun *they* has an ambiguous antecedent: it could refer to *many people* or *different fields*. Therefore, rephrasing it to *these fields* clarifies the sentence.

(Chapter 13 Lesson 5: Pronoun Agreement)

36. **B** This sentence should be placed between sentence 2 and sentence 3, because sentence 2 describes *one way*, and the inserted sentence follows logically

with *another way*. The inserted sentence must also precede sentence 3, because the inserted sentence provides only background information to the central idea of the passage, which is introduced in sentence 3.

(Chapter 13 Lesson 15: Coordinating Ideas)

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37. **D** The original phrasing is awkward and wordy. Choice (D) is far more concise, and is the clearest of the alternatives because it uses the active voice, a strong subject, and a concrete subject.

(Chapter 13 Lesson 15: Coordinating Ideas)

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38. **E** The original phrasing contains two errors in idiom: *used for projecting* and *projecting on*. The correct idioms are *used to project* and *project onto*. Also, since the sentence discusses many artists and many images, there must have been many *screens*.

(Chapter 13 Lesson 10: Idiom Errors)

(Chapter 13 Lesson 12: Other Problems with Modifiers)

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39. **E** Choice (A) undermines the purpose of the essay by suggesting that its topic is irrelevant, and so is a very poor ending. Choice (B) does not provide a concluding thought, but rather an incidental comment that is only tangentially related to the rest of the essay. Choice (C) likewise introduces a thought begging to be developed, rather than a conclusive and *hopeful* note as the question requires. Choice (D) seems to provide a conclusive thought with an air of hope, but it is not appropriate to the final paragraph, which discusses the *controversy* behind Hockney's theory. Choice (E) fits logically into such a discussion and also provides a hopeful concluding thought.

(Chapter 13 Lesson 15: Coordinating Ideas)